

CONSTRUCTION AND BUILDING TECHNOLOGY

# Joinery



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# WorldSkills Occupational Standards (WSOS)

## The name of the occupation is

Joinery

## Description of the associated work role(s) or occupation(s)

A joiner generally works on commercial and residential projects. There is a direct relationship between the nature and quality of the product required and the payment made by the customer. Therefore, the joiner has a continuing responsibility to work professionally in order to meet the requirements of the customer and thus maintain and grow the business. Joinery is closely associated with cabinet making and carpentry plus other parts of the construction industry and with the many products that support it, normally for commercial purposes.

The joiner is usually based in a workshop because the formation of various joints requires specialist machinery, but sometimes undertakes installations in the homes of customers and on building sites. He or she will produce and interpret drawings, set out and measure, cut, form joints, assemble, install, and finish to a high standard. The joiner usually produces items such as interior and exterior doors, windows, stairs, tables, and bookshelves.

Work organization and self-management, communication and interpersonal skills, problem solving, innovation and creativity, working precisely and accurately are the universal attributes of the outstanding joiner. Whether the joiner is working alone or in a team the individual takes on a high level of personal responsibility and autonomy. From working safely through to exceptional planning and organizing, accuracy, concentration, and attention to detail to achieve an excellent finish, every step in the process matters. Mistakes are largely irreversible and very costly.

With the international mobility of people, the joiner faces rapidly expanding opportunities and challenges. For the talented joiner there are many commercial and international opportunities; however, these carry with them the need to understand and work with diverse cultures and trends. The diversity of skills associated with joinery is therefore likely to expand.

## General notes on the WSOS

The WSOS specifies the knowledge, understanding, and specific skills that underpin international best practice in technical and vocational performance. It should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business ([www.worldskills.org/WSOS](http://www.worldskills.org/WSOS)).

The skill competition is intended to reflect international best practice as described by the WSOS, and to the extent that it is able to. The Standard is therefore a guide to the required training and preparation for the skill competition.

In the skill competition the assessment of knowledge and understanding will take place through the assessment of performance. There will only be separate tests of knowledge and understanding where there is an overwhelming reason for these.

The Standard is divided into distinct sections with headings and reference numbers added.

Each section is assigned a percentage of the total marks to indicate its relative importance within the Standards. This is often referred to as the “weighting”. The sum of all the percentage marks is 100. The weightings determine the distribution of marks within the Marking Scheme.

Through the Test Project, the Marking Scheme will assess only those skills that are set out in the Standards Specification. They will reflect the Standards as comprehensively as possible within the constraints of the skill competition.

The Marking Scheme will follow the allocation of marks within the Standards to the extent practically possible. A variation of up to five percent is allowed, provided that this does not distort the weightings assigned by the Standards.

# WorldSkills Occupational Standards

Section	Relative importance (%)
<b>1 Work organization and management</b>	<b>5</b>

The individual needs to know and understand:

- Health and safety legislation, obligations, and regulations which control the work process
- The principles of working safely with electrical equipment or tools
- Emergency procedures and reporting processes for accident, first-aid, and fire
- The situations when personal protective equipment (PPE) must be used
- The uses, care, maintenance, and safety of tools, machines, and equipment
- Care and safety of materials during storage
- The significance of keeping a clean and tidy work area
- Ways in which working practices can minimize wastage and help to manage/control the costs of the manufacturing process
- Sustainability measures applying to the use of 'green' materials and recycling
- The time normally required for key joinery processes
- Principles and measures to carry out work in harmony
- The significance of planning, accuracy, checking, and attention to detail in all working practices
- The role of the individual in maintaining a successful business
- The value of managing own continuing professional development

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The individual shall be able to:

- Follow health and safety standards, rules, and regulations
- Maintain a safe working environment
- Identify and use the appropriate personal protective equipment including safety footwear, ear and eye, and dust protection
- Select, use, clean, maintain and store all hand and powered tools and equipment safely
- Select, use, and store all materials safely
- Plan the work area to maximize efficiency and maintain the discipline of regular tidying and cleaning
- Measure accurately and avoid wastage
- Work efficiently and check progress and outcomes regularly to avoid financial penalties
- Critically evaluate own work

Section	Relative importance (%)
<b>2 Communication and interpersonal skills</b>	<b>5</b>

The individual needs to know and understand:

- The importance of establishing and maintaining customer confidence and trust
- Non-verbal communication
- The negotiation process
- The roles and requirements of architects and related trades and the most effective methods of communication
- The value of building and maintaining productive working relationships with colleagues and managers
- The importance of swiftly resolving misunderstandings and conflicting demands
- Progress reporting methods

The individual shall be able to:

- Gain trust of customer, interpret requirements, and manage expectations positively
- Visualize and translate customer wishes, giving advice and making recommendations/providing options which meet/improve their design and budgetary requirements
- Positively support and lead decision-making assertively
- Liaise with suppliers to negotiate prices and place orders
- Produce a cost and time estimates for customers
- Introduce architects and related trades to support customer requirements
- Recognize, respect, and adapt to the changing needs of architects and related trades
- Integrate, facilitate communication, and work positively within a team situation, e.g. on a building sited
- Clearly communicate with colleagues where drawings, variations to the documents, and work restrictions are required
- Follow instructions, meet deadlines and report on progress in the appropriate format

<b>3 Problem solving, innovation, and creativity</b>	<b>5</b>
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The individual needs to know and understand:

- The common types of problem which can occur within the work process
- Diagnostic approaches to problem solving
- The challenges of restoration projects
- Trends and developments in the industry

Section	Relative importance (%)
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The individual shall be able to:

- Check work regularly for accuracy/standard to minimize problems at a later stage
- Recognize and understand problems swiftly and follow a self-managed process for resolving
- Challenge incorrect information to prevent problems
- Develop creative solutions to challenges when working on restoration projects
- Recognize opportunities to contribute ideas to improve the product and overall level of customer satisfaction
- Keep up to date with changes in the industry
- Demonstrate a willingness to try new methods and embrace change

<b>4 Produce a working drawing</b>	<b>6</b>
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The individual needs to know and understand:

- The essential information that must be included in a working drawing
- The ISO standards which must be followed
- Geometry and trigonometry
- The significance of an accurate working drawing as a basis for accurate joinery
- The importance of checking the working drawing for missing information or errors and pro-actively taking corrective action

The individual shall be able to:

- Check the location of the finished product and environmental conditions
- Check the type and level of the floor area/walls
- Accurately measure and record the size/shape of the area in which the completed product will be installed
- Produce lines which are: straight, crisp, accurate, meet clearly at intersections and are of a consistent thickness and correct weight
- Produce a range of line types including object, fresh, hidden, and break
- Produce joint details which are accurate and correctly proportioned
- Ensure that all measurements meet specification
- Identify drawing errors or items that require clarification
- Determine and check quantities of materials required for construction

Section	Relative importance (%)
<b>5 Preparing materials</b>	<b>5</b>

The individual needs to know and understand:

- Different types of material and their process of manufacture to include: hardwood (elm, beech, ash, oak, mahogany, maple), softwood (spruce, redwood, douglas fir), and timber-based manufactured boards (chipboard, block and, lamin board, plywood) and other panels for heat conservation and noise reduction
- Characteristics of timber, timber-based manufactured boards, and materials to include durability, weight, workability, compatibility with other materials, ability to take preservatives, and finishes
- The range of faults found within wood and their causes
- Eco-consciousness and the significance of using environmentally friendly material

The individual shall be able to:

- Thoroughly inspect the material when purchasing to identify any defects to include knots, shakes, splits, cupping, bowing, rot, pith, stain, sap ducts, twist, worm infestation, case hardening
- Saw to material list and leave for specified time for the drying process
- Select, order, and purchase additional materials e.g. “door furniture” glass, plastic, and adhesives
- Use correct machining techniques safety
- Plane to achieve “squareness” and thickness
- Use “face marks” in the setting out process
- Use machines to final specification required and attach with glue as necessary

<b>6 Internal and external joints</b>	<b>28</b>
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The individual needs to know and understand:

- Different types of joint to include mortice-and-tenon, dovetail, biscuit, lap, and spline
- The need for close fitting joints to form a good surface area for gluing
- The importance of not fitting joints too tightly, requiring excessive force during assembly
- The importance of correct joints and proportions

Section	Relative importance (%)
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The individual shall be able to:

- Accurately produce mortices by hand and using a variety of machines e.g. hollow chisel morticer
- Produce mortices which are parallel and free from cutter or chisel marks
- Produce mortices and haunches to the correct size in the drawing
- Produce tenons by hand and machine e.g. traditional tenon saws, Japanese pull saws, band saw, powered hand router, and mitre saw
- Produce tenons that are parallel and free from undulations
- Produce well-fitting mortice and tenon joints which fit together with a “push fit”
- Check and confirm internal joint geometry conforms with the working drawing including length of tenon and depth of mortice
- Accurately produce tight fitting joints without gaps
- Produce joints which are parallel and clean
- Produce joints to the correct size in the drawing
- Ensure faces, edges, and all shoulders are square straight and to the drawing

<b>7</b>	<b>Assembly</b>	<b>12</b>
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The individual needs to know and understand:

- The need for perfect fitting joints to make the connection
- Different types of glue and their purpose
- Reactions of some woods to glue and negative impacts
- Properties of any metals used e.g. screws
- Cost of mistakes

The individual shall be able to:

- Undertake a trial assembly to check it fits together, with no gaps, and conforms to the working drawing
- Take any necessary corrective action
- Sand the inside, select, and prepare the glue
- Prepare the edging for protection e.g. wood, plastic; apply the glue evenly and attach the edging, ensuring there are no “twists” and that it is “square”
- Use filling where necessary/appropriate and ensure joints are complete and well finished

<b>8</b>	<b>Measurements</b>	<b>15</b>
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The individual needs to know and understand:

- How to make pieces of joinery to the correct specifications
- How to interpret the working drawing to check the measurement of a project
- Use of correct measurement tools



Section	Relative importance (%)
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The individual shall be able to:

- Produce joinery to the correct measurements using tape measures, folding rules, and other measuring devices
- Check diagonals for squareness
- Ensure that all components are the correct length and shape in according to the drawing

<b>9</b>	<b>Finishing</b>	<b>15</b>
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The individual needs to know and understand:

- The use of hand tools in the finishing of a joinery project
- Types of sanding paper, for the wood, and varnishing

The individual shall be able to:

- Complete the product to the drawing specifications
- Determine the quality standard required by customer/trades for further processes e.g. for staining, painting, lacquering/polishing, or oiling
- Produce a smooth surface, curves, moulds, and edges through sanding by machine and hand
- Control flush and regulate the edge during sanding
- Check the quality of the surface e.g. free from glue and any defects or chips

<b>10</b>	<b>Installing</b>	<b>4</b>
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The individual needs to know and understand:

- Different techniques of fixing
- Range of glues and their preparations
- Condensation and preventative actions

Section	Relative importance (%)
<p>The individual shall be able to:</p> <ul style="list-style-type: none"> <li>• Check quality and completeness of all components</li> <li>• Plan and schedule transportation and check all tools and machines are in good working order and available/are on site</li> <li>• Check the location of the installation e.g. for water pipes and wiring and liaise with plumbers and electricians/other trades for advice and support</li> <li>• Check with customer where changes may be necessary to the positioning/fixing and discuss options</li> <li>• Protect installation area as necessary e.g. floor coverings</li> <li>• Take care not to damage any flooring or wall finishes/contents</li> <li>• Work around the needs of customers to avoid disturbance/disruption to services as much as possible e.g. drilling on concrete</li> <li>• Maintain security of the premises/work area</li> <li>• Present the installation to meet customer and related trades needs and expectations</li> </ul>	
<b>Total</b>	<b>100</b>

## References for industry consultation

WorldSkills is committed to ensuring that the WorldSkills Occupational Standards fully reflect the dynamism of internationally recognized best practice in industry and business. To do this WorldSkills approaches a number of organizations across the world that can offer feedback on the draft Description of the Associated Role and WorldSkills Occupational Standards on a two-yearly cycle.

In parallel to this, WSI consults three international occupational classifications and databases:

- ISCO-08: (<http://www.ilo.org/public/english/bureau/stat/isco/isco08/>) ILO 7115
- ESCO: (<https://ec.europa.eu/esco/portal/home>)
- O\*NET OnLine ([www.onetonline.org/](http://www.onetonline.org/))

This WSOS appears to relate most closely to *Construction Carpenters*:

<https://www.onetonline.org/link/summary/47-2031.01>

and, at a higher level of generality, *Carpenters and Joiners*:

<http://data.europa.eu/esco/isco/C7115>

Adjacent occupations can also be explored through these links.

The following table indicates which organizations were approached and provided valuable feedback for the Description of the Associated Role and WorldSkills Occupational Standards in place for WorldSkills Shanghai 2022.

There were no responses to the requests for feedback this cycle.